

Invertebrata

Tasmania's Invertebrate Newsletter

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Invertebrata is produced by the Queen Victoria Museum and Art Gallery, Launceston, Tasmania.

We publish articles and short notes on all aspects of invertebrate biology and conservation in Tasmania.

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Spider crab aggregation on Tasmania's northwest coast

Caleb Gardner

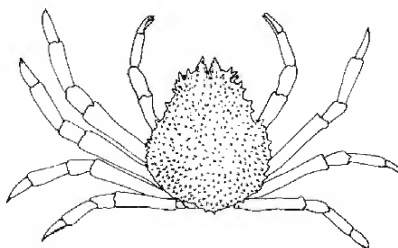
In early June large numbers of spider crabs were washed up on beaches at several locations along the northwest coast. There was a lot of public concern, as many people assumed this stranding was caused by pollution or a biological disaster along the lines of the recent pilchard kills. My impression is that the event was far less sinister and was just a natural phenomenon.

The strandings followed large aggregations of spider crabs in shallow coastal waters. At Stanley the sea floor around the wharf was completely covered in living spider crabs. So the first issue in understanding the stranding event is to explain how so many crabs came to be in the bays in the first place.

Aggregation behaviour in spider crabs is quite common. The species involved in this event was *Leptomithrax gaimardii* (M-Ed.), which is abundant around Tasmania's inshore coastal areas, particularly on silty substrates. Several species of *Leptomithrax* form aggregations into mounds. This behaviour is seen in numerous species of spider crabs (family Majidae) worldwide, including commercially important species such as *Maja squinado* (Mediterranean), *Chionoecetes opilio* (snow crab, Canada), and *Hyas coarctatus* (Canada). Majids appear to be social animals and I've seen large numbers of *L. gaimardii* moving in scattered groups, similar to the groups of soldier crabs that are common in Tasmania's intertidal areas.

Aggregating appears to occur for several reasons. *L. gaimardii* is usually found in loose groups as part of normal behaviour, but they frequently form very dense piles up to 1 m deep and several meters across. These often occur when females moult and become receptive to mating while soft-shelled. At other times the mounds consist of hard shelled intermoult crabs, so we can only speculate what causes these 'hard' aggregations. In the recent strandings, all of the crabs we sampled had either just moulted, or were about to moult. Both males and females were seen so this

(continued on page 2)



The spider crab *Leptomithrax gaimardii*

Editorial

Your editor has had his left hand in a splint for the past fortnight. One-handedness is a disability in a tool-using ape, but most animals have at least six limbs and probably wouldn't be as frustrated as I am at the moment. On the other hand (sorry) *Homo* is unique in the Animal Kingdom in that having cut a tendon in one hand, he can generally get out of washing dishes for a few weeks.

Which Tasmanian invertebrate, I wonder, is least likely to suffer inconvenience from the loss of a limb? That may be just another way of asking which has the most appendages. It's a good question. I strongly suspect the winner is one of our polychaete annelids. Can we have some suggestions from the Tasmanian Marine Naturalist Association (see p. 8)?

The terrestrial front-runner is probably a millipede in the unpublished genus '*Acuminosiphon*' (Polyzoniida, Siphonotidae). The only known local species is widespread but not particularly abundant. It's cream in colour with two black longitudinal stripes, and mature females can be more than 30 mm long. '*Acuminosiphon*' accumulates leg-bearing segments as it grows, a process known as *anamorphosis*. Dennis Black of La Trobe University, who studies this group of millipedes, has counted up to 73 segments in the Tasmanian '*Acuminosiphon*'. This works out to nearly 300 legs.

* * *

We apologise for all the threatened species in recent issues, but threatened species money is becoming more and more important in helping invertebrate zoologists pay their bills these days. We need to remember, though, just how little money is involved. As reported in *Invertebrata* 13,

only 10% of Commonwealth funding for fauna conservation in Tasmania is spent on invertebrates, and

over the past nine years, more than half of the fauna conservation money has been spent on just four species of bird.

* * *

Sadly, three contributors were unable to meet this issue's deadline on 25 June. Look for a much fatter *Invertebrata* in November! (Copy by 22 October, please.)

spider crab aggregation

(continued from page 1)

wasn't a mating event (when males must be hard-shelled). Perhaps the animals were aggregating as a predator avoidance strategy while they were soft-shelled?

In any case, the aggregations are perfectly normal. Francois Péron's accounts of his journey around Tasmania in 1802 mentions aggregations: '*spider crabs, which delight in filth and mud, abounded to excess on every point in the [D'Entrecasteaux] channel*' (Plomley *et al.* 1990). Fishermen who use gill nets along the northwest coast encounter them every year, and scallop dredgers often go through the middle of mounds and fill their dredges.

So how did they all come to be washed on the beaches of the Northwest? It turns out that most of the 'crabs' that people saw were just the cast-off exoskeletons (exuvia) of the animals, so the 'stranding' event was a bit of a fizzer. However, there were some whole animals washed up. The most probable cause was the extreme northwesterly swell experienced during this period — the crabs were aggregating in the wrong place at the wrong time. They would have been especially vulnerable to being washed ashore, as their muscles are reduced during moulting to enable their limbs to be extracted, and spider crabs are very weak and spindly even in peak health. Herbert Hale reported this sort of stranding in South Australia in the 1920s (Hale 1927) and it been recorded from Stanley every few years for the last 20 years. It seems to be a regular natural event.

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Further reading:

Plomley, B., Cornell, C. and Banks, M. 1990. Francois Péron's natural history of Maria Island, Tasmania. *Records of the Queen Victoria Museum* 99: 1-50.

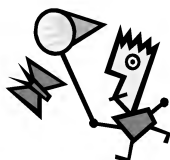
Hale, H.M. 1927-29. *The Crustaceans of South Australia*. Adelaide: Government Printer, South Australia.

Code 4!

The fourth edition of the International Code of Zoological Nomenclature is currently with the printer and will be available in two months.

The new Code will supersede the current third edition by January 1st, 2000.

Main distributors of the Code will be the ICZN Secretariat (c/o The Natural History Museum, Cromwell Rd., London SW7 5BD, UK; contact J D D Smith; jdds@nhm.ac.uk) and the American Association for Zoological Nomenclature, MRC-159, National Museum of Natural History, Washington D.C. 20560-0159 USA; D G Smith; smithd@nsmnh.si.edu).



Coming to Tasmania for a quick sweep?

A notice of your planned collecting trip in *Invertebrata* will put you in touch with local experts, enthusiasts and volunteer helpers. Local zoologists would also be interested to hear where you went and what you found!

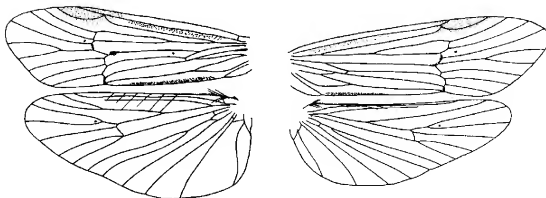
Rediscovery of McCubbin's and Lake Pedder caddisflies

The endangered McCubbin's caddisfly (*Taskiria mccubbini*) and Lake Pedder caddisfly (*Taskiropsyche lacustris*) have recently been recollected from the Lake Pedder area. Both species (family Kokiriidae) were first found at the original Lake Pedder in 1965 but had not been collected since, despite targeted searches.

The rediscoveries were made by Brett Mawbey and myself from the Inland Fisheries Commission while doing summer survey work for threatened caddisflies in the World Heritage Area, with funding from the WHA Zoologist. The two males of *T. mccubbini* were found in a sample taken in November 1998 using an automatic UV light trap set on the shore of Lake Pedder below Coronation Peak. A single male of *T. lacustris* was collected in January near Ted's Beach. Identifications were made by David Cartwright in Melbourne and confirmed by Dr Arturs Neboiss, who originally collected and described the species.

In total 87 species were identified among ca. 4500 specimens collected. Another threatened species collected was the spotted microcaddisfly (*Orphninoirichia maculata*) and there are tentative identifications of *Dipterona ?lyella* and *Hydrobiosella ? armata*. Our knowledge of the distribution of all the species collected has been greatly increased.

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Male wings of *Taskiria mccubbini* Neboiss 1977 (left) and *Taskiropsyche lacustris* Neboiss 1977 (right), from Neboiss (1981)

[*T. mccubbini* and *T. lacustris* are both listed as 'endangered' under Tasmania's Threatened Species Protection Act 1995. Five years ago they were thought 'likely to be extinct because original habitat destroyed' (Invertebrate Advisory Committee 1994). A similar story comes from Victoria, where Tim Doeg rediscovered the 'extinct' Dandenong Amphipod *Austrogammarus australis* and the 'extinct' Otway Stonefly *Eusthenia nothofagi*. He commented, 'While this news should be greeted with joy by invertebrate biologists, it calls into question the current conservation status categories and processes when dealing with aquatic macroinvertebrates.' See Doeg (1997) for a discussion of the issues involved.

— Ed.]

Further reading:

- Doeg, T.J. 1997. Gone today, here tomorrow — extinct aquatic macroinvertebrates in Victoria. *Memoirs of the Museum of Victoria* 56: 531-535.
- Invertebrate Advisory Committee. 1994. *Interim List of Native Invertebrates Which are Rare or Threatened in Tasmania*. Hobart: Parks and Wildlife Service.
- Neboiss, A. 1981. *Tasmanian Caddis-flies. Fauna of Tasmania Handbook No. 4*. Hobart: Fauna of Tasmania Committee, University of Tasmania.

Notices & reviews

OECD Workshop on Terrestrial Flatworms, New Zealand, 1998; *Pedobiologia* 42(5-6): 385-584; issue edited by G.W. Yeates.

Relevant papers include:

- Winsor, L., Johns, P.M. and Yeates, G.W. Introduction, and ecological and systematic background, to the Terricola (Tricladida); pp. 385-388.
- Winsor, L. Collection, handling, fixation, histological and storage procedures for taxonomic studies of terrestrial flatworms (Tricladida: Terricola); pp. 405-411.
- Carranza, S., Ruiz-Trillo, I., Littlewood, D. T.J., Riutort, M. and Baguña, J. A reappraisal of the phylogenetic and taxonomic position of land planarians (Platyhelminthes, Turbellaria, Tricladida) inferred from 18s rDNA sequences; pp. 433-440.
- Winsor, L. The Australian terrestrial flatworm fauna (Tricladida: Terricola); pp. 457-463.
- Sluys, R. Land planarians (Platyhelminthes, Tricladida, Terricola) in biodiversity and conservation studies; pp. 490-494.
- Boag, B., Yeates, G.W. and Johns, P.M. Limitations to the distribution and spread of terrestrial flatworms with special reference to the New Zealand flatworm (*Artioposthia triangulata*); pp. 495-503.
- Jones, H.D., Green, J. and Palin, D.W. Monthly abundance, size and maturity in a population of the 'Australian flatworm', *Australoplana sanguinea alba*; pp. 511-519.
- Yeates, G.W., Boag, B. and Johns, P.M. Field and laboratory observations on terrestrial planarians from modified habitats in New Zealand; pp. 554-562.
- Unger, J.-G. The impact of quarantine regulations for terrestrial flatworms on international trade; pp. 579-584.

The entire issue can be obtained from the publisher, Gustav Fischer Verlag, PO Box No. 100 537, D-07705 Jena, Germany (www.gfischer.de), or through local agencies for *Pedobiologia*.

Winner!

The Prof. Bugman doll has been won by Dr Barbara York Main (Western Australia). We greatly appreciate Dr Main's donation, and we remind all readers that contributions to help cover the *Invertebrata* production costs are always welcome!

Happenings at QVMAG

The pace is still ultra-hectic at the QVM with the Russian Fossil Insect Exhibition becoming top priority for Zoology for a time, throwing all our other work behind. More about this exhibition elsewhere in this issue, except to say that Tammy Gordon and I in particular are relieved that it is up and open — and hopefully it should get finished in the next week or so (with a bit of luck).

The new Zoology store in the neighbouring TAFE College building is now fully operational. All the invertebrate wet specimens have been transferred into it from the Rocherlea store, and work has commenced on rehousing and reorganising these materials. Of particular concern is the large amount of material from the Monitoring River Health Initiative and Inland Fisheries Commission collections. This needs rehandling to upgrade its status and make it more readily available for further study. We are going to have a blitz on these freshwater specimens in the next couple of months to try to achieve these goals before the end of the year.

The new store is now the home for most of our large vertebrate mounts, and the space these specimens used to occupy has been reclaimed to serve a more useful purpose. We have relined and painted the old Dry Store, installed a large work bench, put in much better lighting and an exhaust fan, and we now have a General Zoological Laboratory! We have moved all our dry insect collections into it so that it also becomes our new entomology work area. Big things are planned in the next few months with our general entomological holdings.

Finally, we have just heard that capital works funding towards the construction of a new spirit store on the Wellington Street site has been approved (subject to final Council endorsement) and that detailed planning can now go ahead. This will probably be a staged construction with the first stage being the rehousing of the vertebrate wet collections now remaining at Rocherlea. At Wellington Street these will once again be under the watchful eye of Zoology staff. Then, hopefully, the new 'Compactus' unit and the invertebrate wet collections now in the TAFE Store will be moved to the second stage of the new, permanent spirit store.

Meanwhile, Tammy and Judy Rainbird are valiantly dealing with the ever-increasing number of public enquiries as well as trying to bring order to the relocated collections, both in the new store and the basement area. As Acting Curator I am gradually being drowned in paper while the prospect of once again looking at molluscs is receding further and further into the distance. I did manage to publish the latest issue of the journal *Molluscan Research* recently but that is the only contact I've had with the phylum in the last month or so. We hear that Tim Kingston is still enjoying his rainforest walks in the North Queensland winter — but we don't really want to know that, do we?.

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DPIWE curating...

We were very pleased to have a short visit to the collection from Dr. Rolf Oberprieler, the Zimmerman Fellow, from ANIC. He was in Tasmania principally to consult with Dr. Zherikhin who was at the Queen Victoria Museum in Launceston with his fossil exhibition (see p. 7). Fortunately he was also able to come and sort through our weevil accessions which has been a great help. It is always good to have visits from specialists such as Rolf, glean information from them and showing what we have in the collection.

Databasing is progressing well with all our quarantine specimens and all records from our 20 volumes of *Insect Pest Occurrences* now entered. Work is currently in progress on databasing all our specimens of Arthur Lea's mainland and overseas collections.

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DPIWE introducing...

We have a new entomologist in northern Tasmania. Jean Bentley (Jean.Bentley@dpiwe.tas.gov.au) came here in 1998 from Victoria. For several years she was part of a Knoxfield Institute for Horticultural Development team that developed and implemented Integrated Pest Management for field tomatoes in Victoria and southern NSW. Jean now lives at Port Sorell and works part-time for DPIWE in Devonport. She is developing and demonstrating production techniques for growing hydroponic greenhouse capsicums for export. Jean trained at La Trobe University in Biological Science with emphasis on biochemistry and genetics. She is also a skilled photographer and trained at the Royal Melbourne Institute for Technology. Her images of insects have been used in agricultural publications. I am hoping to employ her temporarily to illustrate beneficial and pest insects associated with vegetable crops.

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Remember...

...the story on giant squids in *Invertebrata* 10 (March 1998)? Now you can see the animals in full colour:

Norman, M. 1999. Riveting sex in the giant squids. *Nature Australia* 26(5): 24-27 (Winter 1999 issue).

Anoglypta crawls off list

The land snail *Anoglypta launcestonensis* was removed from Tasmania's Threatened Species List in mid-April. (See *Invertebrata* 13 for background.) The decision has been appealed on procedural grounds, but the most this is likely to achieve is a re-advertising of the decision with a further public comment period.

Public debate over the delisting revealed misconceptions about why the snail was delisted. The Tasmanian *Threatened Species Protection Act 1995* created a public nomination system for listing and included a species list, but criteria for assessing nominations remained very subjective. Formal criteria were not finalised and released until late 1997. In early 1998 I assessed several snails against the formal criteria and nominated two for delisting, one for downlisting and three unlisted species for listing. The assessment process takes a year, which brings us to early 1999, when the coincidental logging of one of several hundred forestry coupes containing *Anoglypta* led to claims that the Government was delisting the snail to facilitate logging. (Most of its habitat is unloggable for conservation or other reasons.)

The resulting media circus showed that sensationalism about supposedly threatened invertebrates is easily spread, although there were a few vaguely balanced articles. Green groups involved had little trouble getting misleading information about the species published in major newspapers. These included the claims that the snail was 'endangered', that it was confined to highlands or rainforests (a claim pushed by inventing deceptive common names for the species), and that Forestry Tasmania had covered up part or all of my 1996 report on the snail. In fact, *Anoglypta* has not had 'endangered' status on any list since 1994, and Forestry Tasmania simply printed too few copies, accidentally including a recommendation from an earlier draft written on the assumption that an important estimate would not become available. The 'covered up' report has been available in the State Library for years.

Several aspects of the public debate were especially regrettable. Fran Voss (*Launceston Examiner*, 11 April) interviewed fellow snail expert Dr Brian Smith (who disagrees with delisting),

but still managed to say the snail was 'confined to the deep moist litter of wet temperate rainforest in the Mt Victoria, Mt Maurice, Mt Arthur and Cumberland Falls areas' — four mistakes (underlined) in one sentence!

The *Tasmanian Conservationist* (April) contained a lurid article, among other things accusing the government (not me) of trying to delist the snail — this in the same issue with two pages of what looked like very credible scientific writing on the crayfish *Astacopsis gouldi*.

The *Australian* newspaper (20 April) printed letters claiming that the delisting somehow prevented Greens from speaking out against logging and that my study's Forestry funding was absurd. I have also worked for the Tasmanian Conservation Trust and have nominated snails for listing which live mainly in production forest, but apparently supporting the delisting of just one species makes me a Forestry puppet. The *Australian* did not print my letter pointing out that their pictured 'Simson's Stag Beetle' looked more like *Lissotes rudis* than *Hoplogonus simsoni*.

Silliest of all, Green MHA Peg Putt (March 16) used parliamentary privilege to incorrectly accuse me of writing 'the original report ... that he now criticises' and of using dead snail numbers in my population estimates.

In non-public debate, a fuss was apparently made about the unpublished nature of my work. I had not published it because I was waiting for all land tenure inquiries to conclude so that estimates of reserved habitat area would not become outdated. The fuss was excessive because nearly all invertebrate status recommendations are based on unpublished, unreplicated work involving a far smaller research effort than was the case for *Anoglypta* — and that includes its original IUCN listing. I was also accused of surveying too many streamside sites. A snail occurring in areas containing rainforest trees will obviously occur disproportionately in streambanks, which were not in any case found to be significantly better than similar non-streamside sites.

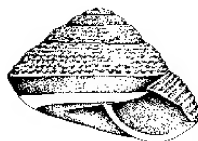
There are lessons to be learned here for invertebrate zoologists who want the State list to be effective and credible. The listing process, although very cautious, can withstand public pressure when the evidence is overwhelming. Scientists who have filled their reports with disclaimers to prevent the forest industry from misusing them will now

have to 'greenie-proof' them to discourage even worse misuse by the other side.

Scientists considering nominating species will also have to be sure that those species are definitely threatened at the level indicated, or risk attacks on their credibility if they later try to revise the listing. This is unfortunate, because IUCN recommends that species plausibly considered probably threatened (and I do not think *Anoglypta* ever fitted this category) should be listed until more data is available. Scientists in the habit of nominating under-researched species for threatened status as a 'precaution' should realise that a truly cautious attitude (and a fair one to other scientists) involves calling such species 'insufficiently known', not 'endangered'.

Lastly there is a need for a less secretive and less adversarial method of assessing nominations. The nominator and any objectors should be able to meet at recorded, public conferences where the latter can raise their concerns and the former answer them, and these meetings (not biased press releases) should form the basis of media coverage.

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Endangered (1983)



Vulnerable (1995)



Probably safe (1999)

Good news for the BBC

Survey work over the past year has produced some good news for the threatened Burnie Burrowing Crayfish, *Engaeus yabbimunna*. Discovered in 1992 by Bill Walker of the Burnie City Council, this species had previously only been known from isolated colonies on three small streams within urban Burnie: Shorewell Creek, Romaine Creek, and the eastern arm of Cooee Creek. In these areas, increases in waterway pollution and habitat removal are believed to have led crayfish populations into sharp decline.

In March 1998, however, Jim Nelson of the Deloraine Field Naturalists Group (now the Central North Field Naturalists) found a colony of *E. yabbimunna* on a block of Crown land on Seabrook Creek, several catchments to the west of Burnie. Follow-up work by the Parks & Wildlife Service and the Forest Practices Unit has now found the species along most of the Seabrook Creek catchment, as well as on Camp Creek, Distillery Creek, two small intervening catchments and a tributary of the Cam. The species is bounded by the distribution of several other *Engaeus* species, particularly along the coast.

These discoveries are of great importance for the conservation of *E. yabbimunna*, not only because they significantly increase its known distribution, but because they extend the species into a far better quality and quantity of habitat than is available within the city zone. The new colonies are also better protected from the polluting and destructive activities that threaten their urban relatives.

Such good news, however, should be not be met with complacency. Even with the newly discovered colonies of *E. yabbimunna*, the overall distribution of the species remains small and may be at risk from a single catastrophic event. The species is still subject to threatening processes over a large portion of its range, with forestry activity and agriculture now added to the hazards of the urban environment. The greatest warning of all possibly lies in the large gap in the middle of its distribution, as few crayfish of any species are found in the lower reaches of Distillery Creek, the Cam River, Messengers Creek and Cooee Creek (including the whole of the western arm). This absence is believed to be due to the high level of urban and industrial pollution in these areas, and in previous survey work has helped hide the 'new' crayfish populations now identified to the west.

The new colonies of *E. yabbimunna* have provided a respite for the species that should not be squandered. The colonies within Burnie still need to be treated with caution and concern. Such measures will not only protect the Burnie Burrowing Crayfish but will benefit urban water quality and consequently the Burnie community as a whole. In this way, *Engaeus yabbimunna* is both dependent upon, and an indicator of, the health of river systems and our environment.

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Further reading (on the Net):

Doran, N. and Richards, K. 1996. *Management Requirements for Rare and Threatened Burrowing Crayfish in Tasmania*.

(www.rfa.gov.au/cra/tas/crayfish/contents.html)

Marist Regional College. 1998. *Habitat Assessment and Proposed Recovery Plan for the Burnie Burrowing Crayfish (Engaeus yabbimunna) on Shorewell Creek, Burnie, Tasmania*. (www.mrc.tas.edu.au/bbc/index.html)

Historical footnote

Some insights into Tasmanian biogeography can be found in:

Erichson, W.F. 1842. Beitrag zur Insecten-Fauna von Vandiemenland, mit besonderer Berücksichtigung der geographischen Verbreitung der Insecten. [Contribution to the insect fauna of Van Diemen's Land, with particular regard to the geographical distribution of insects] *Archiv für Naturgeschichte* 8(1): 83-291.

Here's some good advice, still valid:

Jedenfalls wird dieser kleine Beitrag dadurch von einigem Interesse sein, dass für die aufgeführten Arten eine bestimmte Localität nachgewiesen ist. Denn durch genaue Angabe der Localität ist es allein möglich, die geographische Verbreitung der einzelnen Arten zu verfolgen und den Umfang und die Grenzen derselben zu ermitteln, es ist der erste Schritt, der in der naturhistorischen Geographie geschehen muss. (p. 84)

[At any rate, this small contribution will be of some interest in that a particular locality is given for the species described. For it is only possible to investigate the geographical distribution of individual species, and to ascertain the extent and limits thereof, with exact locality data. This is the first step which must be taken in natural-historical geography.]

Still true at many spatial scales, and not often explainable:

Von besonderem Einfluss auf den Charakter einer Insecten-Fauna ist der Charakter der entsprechenden Flora, wenn auch, wie es sich zeigen wird, im vorliegenden Falle die erstere nicht ganz und in allen Beziehungen der letzteren folgt (p. 86)

[The character of an insect fauna is particularly influenced by the character of the corresponding flora, even when, as will be shown, in the case at hand the former does not wholly follow the latter in all respects.]

Wanted! Wanted!

Reports of 'people news' and invertebrate goings-on from the Department of Primary Industry, Water and Environment (DPIWE), Inland Fisheries Commission, CSIRO Marine Labs, University of Tasmania departments and any other agencies, institutions or individuals studying invertebrates in Tasmania. We and our readers are especially keen to hear from non-professional zoologists with tales and tidbits about this State's wonderful invertebrate fauna. Pictures are very welcome, both to illustrate animals under discussion and to make *Invertebrata* look more interesting. Contributed pictures should preferably be black-and-white line illustrations, not in colour and not in a range of grays. Please send these as hard copy, as scanned bitmaps on diskette, or as JPEG files by e-mail. Contact the editor if you have any queries about the content or format of contributions.

Insects: THE success story

A large exhibition with this title was opened by Dr Ebbe Nielsen, Director of the Australian National Insect Collection (ANIC), at the Queen Victoria Museum and Art Gallery on 11th June. This is one of the most comprehensive exhibitions on insects, and particularly fossil insects, ever seen in Tasmania. It is centered around a superb display of fossil insects from the collections of the Paleontological Institute of the Russian Academy of Sciences, Moscow and brought to Tasmania by the Head of the Arthropoda Laboratory of that institution, Dr Vladimir Zherikhin.

The exhibition contains over 250 fossil specimens, mainly grouped taxonomically with Recent material for comparison (some of the latter kindly loaned from the Museum of Victoria, with the help of Dr Ken Walker. There are also 41 specimens of insects in amber in a specially made case with back lighting to show the specimens off to maximum advantage. Each case is supplied with a magnifying glass so the material can be viewed more closely. At the entrance to the exhibition is a model of *Psychroptilus burrertae*, the oldest fossil insect found in Tasmania, together with the original specimen from the Geology Department of the University of Tasmania. The exhibition also has a display of Recent insects with cases illustrating 'Insect Biodiversity', 'Insects of Economic Importance' and 'Insect Research'. Besides material from the QVM collections, we borrowed material from the Department of Primary Industries, Water and Environment laboratories in New Town and Devonport. We are grateful for these loans to Margaret Williams and Lionel Hill, and to Tim Kingston for the use of some of his dung beetle collections. There is an interactive computer system with the public being able to access a CSIRO CD ROM on insects.

At the opening, Ebbe Nielsen paid tribute to the Museum and to Dr Pat Rich, Chair of Paleontology at Monash University, who helped facilitate the getting of the material from Moscow. He spoke of the vastness of the insect fauna, and in particular of the part of the fauna not yet known or described and the urgency of continuing the work on these insects, so many of which are under threat from changes in habitat, particularly in areas such as Australia.

Following the opening of the exhibition, more than 50 people stayed for a public lecture given by Dr Nielsen entitled 'Insects: a World of Diversity'. Lavishly illustrating his points with some very high-quality slides, Dr Nielsen gave examples of the importance of insects to the environment and economically to the world. An abstract of his talk appears in the accompanying box.

In his talk, Dr Nielsen discussed insect diversity around the world and named Australia as one of the five most significant areas of species richness. He also stressed the importance, both in the past and now, of the position of 'amateur' workers in the field of insect

taxonomy. One bizarre piece of research he mentioned was the discovery of a group of primitive moths which live exclusively on koala poo — about 40 new species have been recognised. It was a special privilege to attend this lecture by one of the world's leading entomologists.

Come and see the exhibition: it's open until early November.

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'Insects: a World of Diversity' (abstract)

Lecture given 11 June 1999 at QVMAG
by Dr Ebbe Nielsen, Director, ANIC

Insects are by any measure one of the most successful forms of life of all times and certainly the most species-rich form of eukaryotic life. The importance of insects will be detailed in the lecture: for example, insects make a huge contribution to the total value of ecosystem services (such as pollination and nutrient cycling) currently estimated at \$33 trillion (the global GNP is currently about \$18 trillion!).

Remarkably the estimates of the world's insect species diversity vary markedly from 3 to over 100 million with the best estimates currently being some 5 million species of which 1.5 million are named; some 7% are estimated to be Australian.

In many parts of the world including Australia, we very much live in the 'age of discovery' of insects. The rate of discovery of species, phylogeny, distribution and biology will be discussed and examples provided. Examples discussed will include our lack of knowledge about the most serious pests of standing crops, primitive Patagonian moths associated with *Nothofagus* that change our understanding of the evolution of the Lepidoptera (moths and butterflies), primitive Australian moths that change our conservation priorities and the discovery of new insect families from places such as Rome. Some recent discoveries from Tasmania will also be discussed, including a moth that is the largest in its family.

The opportunities and priorities for future discovery will be reviewed as will methods and technologies that enhance our capacity to manage, share and use the information. Because of the rapid environment change the discovery of the insects is urgent if we want to more fully understand life on Earth.

Entomological history

Trevor Semmens, curator of the Department of Primary Industries, Water & Environment insect reference collection, is writing a history of the Department's insect collection to celebrate its 100th anniversary. The collection was started by Arthur Mills Lea, who was the Tasmanian Government Entomologist from 1899 to 1911. Trevor plans to have the book ready for a local launch at the New Town Research Laboratories complex (where the collection is housed) on 20th September. Launches are also planned at the end of September at the annual meeting of The Friends of the South Australian Museum (where Lea went to from Tasmania to greatly assist in establishing a South Australian insect collection), and in early October at the Australian Entomological Society Annual Conference in Canberra.

Invertebrates in the media

For obvious reasons, invertebrates make the news when they're unusually abundant. Let's take a close look at a couple of 'plague' stories that appeared this autumn. The first one is local:

'Between January and March this year the Central Highlands was hit by a grasshopper plague... Farmer Scott Ashton-Jones said the plague had denuded large tracts of country. Many new pasture shoots from rains which fell during that period were "eaten clean off" by the grasshoppers.'

Bruce Mounster, 'Highlands drought aid still possible', *Tasmanian Country*, 14 May 1999, p. 2.

Invertebrata contacted Mr Ashton-Jones, who farms near Ouse and is currently Vice-President of the Tasmanian Farmers and Graziers Association. He said that wingless grasshopper outbreaks had increased in recent years and there were three in the last decade. This year's outbreak was evidenced by the lack of green growth (herbs or grasses) in the upper Derwent valley following good February rains. In a dry year Mr Ashton-Jones has seen the shrub *Bursaria spinosa* denuded of leaves over a large area, with grasshoppers massed on the bare branches.

In late summer, the Tasmanian Government applied for Commonwealth drought relief on behalf of Central Highlands farmers. The reported grasshopper plague formed part of the argument for a Drought Exceptional Circumstances declaration. The application was rejected, and Mr Ashton-Jones regrets that 'no science' had been done to monitor grasshopper numbers.

Entomologist Lionel Hill (DPIWE, Devonport) says the wingless grasshopper *Phaulacridium vittatum* normally eats herbage, but might be expected to eat new, succulent grass shoots if nothing else was available. Useful information on the grasshopper and its impact is contained in an out-of-print publication titled *Tasmanian Pasture Pests: Identification and Control* (J. E. Ireson and P.B. McQuillan; Hobart: Department of Agriculture, 1987).

Notices & reviews

Between Tasmanian Tidelines, a field guide produced by the Tasmanian Marine Naturalist Association, is now available in Hobart at \$9.95 from Liz Turner at the Tasmanian Museum and Art Gallery and Jo Carswell at the Tasmanian Conservation Trust. It is in spiral-bound A5 format and includes a short description of each phylum followed by half a page on each of about 140 organisms (including algae) with black-and-white illustrations and notes. Production was assisted by a grant from the Recreational Fisheries Trust (DPIWE) and was supported by TMAg.

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Invasion of the Killer Seastars

www.abc.net.au/science/slab/starfish/story.htm

This sensational title covered a contribution from Dr Louise Goggin to the Australian Broadcasting Commission's website. The piece is otherwise a very well written, popular introduction to current work on the northern Pacific seastar, *Asterias amurensis*.

Dr Goggin suggests in her article that the phenomenally high abundance of *A. amurensis* in the Derwent estuary might be partly explained by the state of the river:

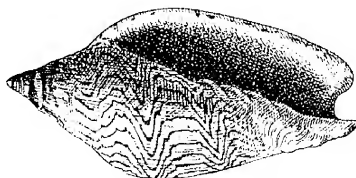
'Some scientists believe that disturbed environments are more prone to invasion. In harbours and ports, dredging to improve shipping channels can destroy native marine communities that are already weakened by pollution. The building of wharves, piers and pylons gives arriving stowaways a vacant home as soon as they jump ship. In Tasmania, a new project (funded by the Natural Heritage Trust) will investigate the link between disturbed environments and the survival of the seastars. It will be interesting to see whether the best method to manage northern Pacific seastars in Australian waters may be to reduce pollution and enhance local plants and animals in estuaries.'

Maybe that ABC title should have been *Invasion of the Killer Humans*, Followed by *Outbreaks of Marine Pests on the Degraded Seabed*.

A CSIRO media release on the seastar was distributed on Friday, 4 June 1999 and appeared in newspapers over the next few days. The release announced:

'The northern Pacific seastar, Asterias amurensis, a marine pest now in plague numbers in Tasmania, is expanding its range in Australia and threatening marine industry and environments, according to a "state-of-the-nation" report on the species.'

The report referred to had actually been written 13 months earlier and released in October 1998. The text is online at www.ml.csiro.au/~spinks/CRIMP/reports/TechReport15.html.



Volutidae

Amoria undulata

Wavy Volute

Height: to 80 mm. Common in offshore sand where it feeds on other molluscs. Often washed up on beaches. The most frequently collected Tasmanian volute. Colour: cream, marked with irregular rows of dark spots and zigzag chestnut brown lines.

Southern WA, SA, Tas., Vic., NSW and southern Qld.

(from *Between Tasmanian Tidelines*)